OPTIMISING COMPENSATOR

B 251
16.02.00

(C ←BUS)   (C ←RING)

DTE 611 Eng. C2

- **Digital controller for boiler plant with annual programming :**
  - control of temperature boilers at fixed point or variable
  - compensated control of heating zone
  - control of DHW temperature and of DHW pump
- **Communication systems :**
  - **C-Bus** compatible
  - **C-Ring** compatible
- **Power supply 230 V ~ ; DIN rail mounting**

C E

1. APPLICATION

DTE 611 controller is designed for winter compensated control of heating plants in, for example :
- administrative and commercial buildings
- schools
- residential complexes

2. FUNCTIONS

The principal functions of DTE 611 are :
- Control of temperature of boiler or boilers at **fixed point** or control at a variable value according to **outside temperature,** to the request for DHW, or to the request for heat from one of heating zones (if controllers are wired in C-Ring with DTE 611).
  - control of a 1- or 2-stage burner or two 1-stage burners in sequence.
- Compensated control of heating plant by 3-wire control of motorised valve :
  - optimisation of start and stop times of plant
  - control of plant pump by timed programme in use with delay in switching off
  - ambient frost protection
  - minimum and maximum flow temperature limits
  - correction of heating curve origin
  - ambient authority
  - Eco Off
- Control of DHW storage tank temperature:
  - control loading pump by detector or only with timed programmes
  - DHW priority and antibacteria function
- 24-hour and 7-day programming with timed events
- Programming with dates : 25 holiday periods; winter season; special period
- Automatic switching GMT-BST
- Summer plant exercise to prevent lockout of valve and pumps
- Metering of degree-days and of operating hours of burners
- Telecontrol for changing programme in use
- Five On-Off inputs for signalling status or alarm.
- Alarms for detector short or open circuits and for irregular operation of plant and controller
- C-Ring connection for local exchange of data with other controllers;
- C-Bus connection for exchange data with local PCs or remote telemanagement PC.

3. DETECTORS, TELECONTROLS & ACCESSORIES

No.	Description	Type	Sensing element t°	Code	Data sheet
1	Heating flow surface temperature detector [1]	**SCH 010**	NTC 10 kΩ	B1	–
1	Outside temperature detector	**SAE 001**	NTC 1kΩ	B2	–
1	Boiler immersion temperature detector [2]	**SIH 010**	NTC 10 kΩ	B4	–
1	DHW immersion temperature detector [3]	**SIH 010**	NTC 10 kΩ	B5	–
	Accessories				
1	Ambient temperature detector	**SAB 010**	NTC 10 kΩ	B3	–
1or2	Flue gases temperature detector	**STF 001**	PT 1 kΩ	B6-B7	–
1	Accessory for connection 4...20 mA active detector	**ASA 420**	–	B8	–
1	Telecontrol for changing programme in use	**CDB 300**	–	R	–
	Alternatives :				
1	1) Immersion temperature detector	**SIH 010**	NTC 10 kΩ	B1	–
1	2) Cable-type temperature detector	**SAF 010**	NTC 10 kΩ	B4	–
1	3) Cable-type temperature detector	**SAF 010**	NTC 10 kΩ	B5	–

4. TECHNICAL DATA

• Electrical

Power supply	230 V~ ± 10%
Frequency	50 … 60 Hz
Consumption	5 VA
Protection	IP40
Radio disturbances	VDE0875/0871
Vibration test	with 2g (DIN 40 046)
Voltage-free output contacts:	
maximum switched voltage	250 V ~
maximum switched current	5 (1) A
Construction standards	Italian Electrotech. Committee (CEI)
Storage data in memory	5 years
Software	Class A

• Mechanical

Case	DIN 6E module
Mounting	DIN 35 rail
Materials:	
base	NYLON
cover	ABS
Ambient temperature:	
operation	0 … 45°C
storage	– 25 … + 60°C
Ambient humidity	Class F DIN 40040
Dimensions	105 x 115 x 71,5
Weight	1,0 kg

• Programmes & periods

24-hour programmes	**1** … 7
24-hour events	**2** … 6
7-day programmes :	**0** … 2
Holiday period	**0** … 25
Special period	1
Remote extension period	0 ... **3** ... 72 h

• Measurement ranges

Flow temperature	0 … 99 °C
Outside temperature	– 30 … + 40 °C
Ambient temperature	0 … 40 °C
Boiler temperature	0 … 99 °C
DHW temperature	0 … 99 °C
Flue gases temperature	0 ... 510 °C
Active detector	4 ... 20 mA

• Heating

Flow temperature :	
radiators	40 ... **70** ... 99 °C
fan coils	40 ... **80** ... 99 °C
panels	20 ... **40** ... 50 °C
minimum limit	**1** … 99 °C

maximum limit	1 … **99** °C
Design outside temperature	– 30 … **– 5** … + 20 °C
Correction curve origin	**20** … 40 °C
Valve actuator run time	30 ... **630** ... 3,600 s
Delay switching off pump	0 ... **30** ... 60 minuti
Ambient authority	**0** ... 20 °C/°C
Mode temperatures:	
ambient of the 5 Normal modes	0 … **19...21** … 30 °C
ambient of the 2 Setback modes	0 … **14...16** … 30 °C
water of Flow modes	0 … **20...30** … 99 °C
ambient of Frost Protection mode	0 … **6.0** … 30 °C
ambient of Remote Extension mode	0 … **21.0** … 30 °C
Optimisation of operating times :	
start inertia	0.00 ... **1.00** ... 7.45 h
"Normal" optimisation limit	0.00 ... **2.00** ... 12.00 h
"Holidays" optimisation limit	0.00 ... **10.00** ... 40.00 h
boosting	0.0 ... **3.0** ... 10.0 °C
reduction ambient temp.optimum stop	0.00 ... **0.5** ... 3.5 °C
time constant	1 ... **48** ... 255 h

• Control boiler

Temperature	0 ... **50.0** ... 99.0 °C
Differential	0.5 ... **5.0** ... 50.0 °C
Increase in heating and DHW	0.5 ... **5.0** ... 50.0 °C
Maximum limit	1 ... **99** °C
Minimum limit	**1** ... 99 °C
Minimum operation of burner	1 minute fixed

• Control DHW

Temperature	0 ... **80.0** ... 99.0 °C
Differential	0.5 ... **5.0** ... 30.0 °C

• Telemanagment (setting by PC)

|	
Attempts send alarms	1 ... **5** … 255
Interval between sending alarms	2 … **10** … 255 min.
Alarms (setting by PC):	
threshold diff. temp. flow (B1)	0.5…**5**…99 °C
delay diff. temp. flow	2…**30**…255 min.
threshold diff. temp. boiler (B5)	0.5…**5**…99 °C
delay diff. temp. boiler	2…**30**…255 min.
threshold diff. ambient temp.(B3)	0.5…**1**…30 °C
delay diff. temp. ambiente	2…**30**…255 min.
overtemperature boiler	1 ... **95** ... 99 °C
threshold diff. temp. DHW (B4)	0.5…**5**…99 °C
delay diff. temp. DHW	2…**30**…255 min.
max. temp. flue gases 1 & 2	1 ... **500** ... 510 °C
detector 4 ... 20 mA : min. or max.	4 ... **12** ... 20 mA

In the presence of electrical disturbances the output controls of the controller may change status but these will recover automatically.

5. OVERALL DIMENSIONS
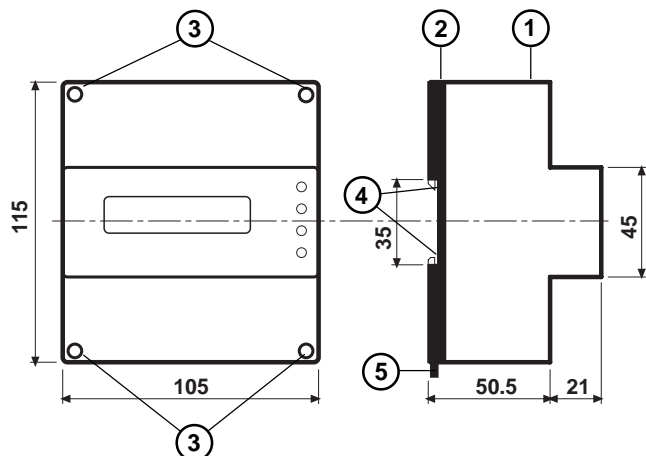
1 – Protective cover for electronic components
2 – Base with transformer, relay & terminal blocks
3 – Screws for fixing cover- base
4 – DIN rail securing elements
5 – DIN rail release lever

6. FACIA
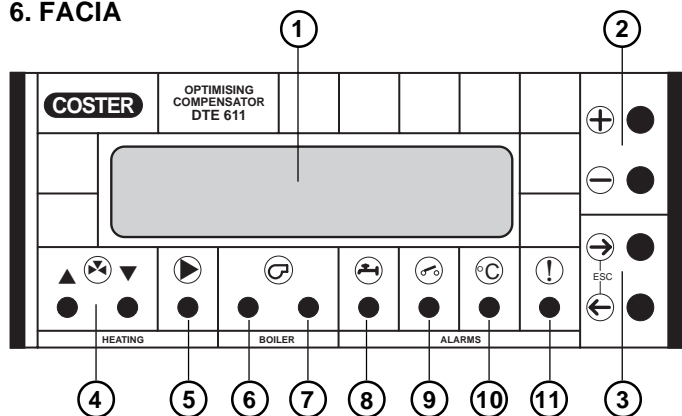
1 - Backlighted two-line alphanumeric display
2 - + and – operating keys
3 - ← and → operating keys
4 - Control valve LEDs
5 - Control pump LED
6 - Burner 1 or 1st stage On LED
7 - Burner 2 or 2nd stage On LED
8 - DHW or secondary circuit On LED
9 - On-Off alarms LED
10 - Measurement alarms LED
11 - Fault LED

7. WIRING DIAGRAM
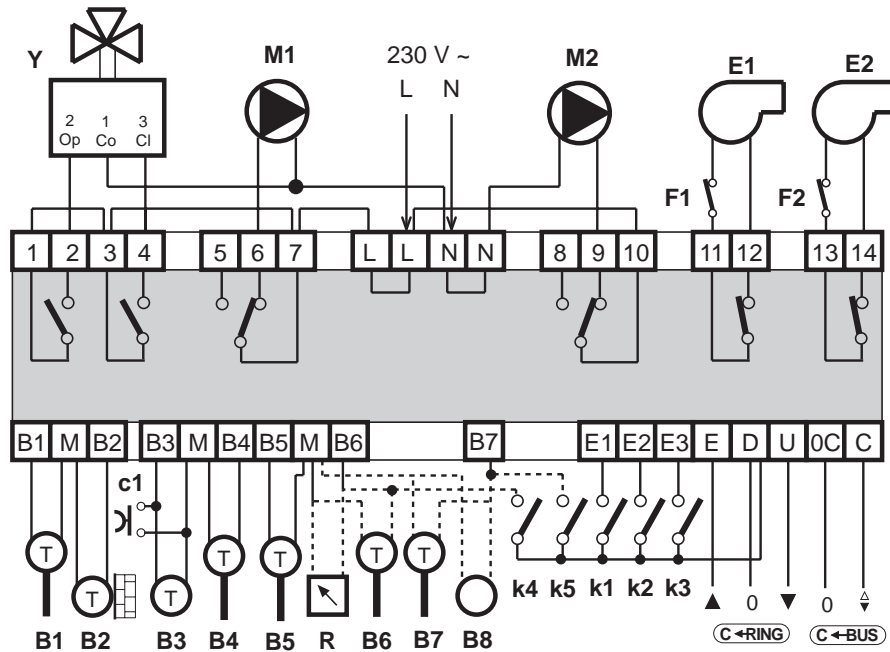
B1 – Plant flow temp.detector
B2 – Outside temp. detector
B3 – Ambient temp. detector
B4 – Boiler temp. detector
B5 – DHW temp. detector
B6 – Flue gases 1 detector (alternative to remote control R)
B7 – Flue gases 2 detector (alternative to detector B8)
B8 – Active detector 4 ... 20 mA (alternative to B7 and k5)
E1 – Boiler 1 or 1st stage boiler
E2 – Boiler 2 or 2nd stage boiler

F1 and F2 – Boiler thermostats
k 1...3 – Alarm contacts
k4 – Alarm contact (alternative to remote control R)
k5 – Alarm contact (alternative to detector B8)
c1 – Remote Extension SPST switch
L – Line 230 V ~
N – Neutral
M1 – Heating pump
M2 – DHW pump or second timed output
R – Remote control for modifying programmes
Y – Motorised heating valve
C-Bus – Transmission telemanagement data
C-Ring – Transmission data between controllers

8. SITING CONTROLLER & DETECTORS

8.1 Controller

The controller must be sited in a dry space, which meets the permitted ambiental limits shown under 4. TECHNICAL DATA. If sited in spaces classified as "Dangerous" it must be installed in a cabinet for electrical appliances constructed according to the regulations in force for the danger class involved.
The controller can be installed on a DIN rail or in a DIN modular enclosure.

8.2 Plant flow temperature detector B1

With plant pump on flow detector must be installed downstream of this ; with pump on return it must be installed at least 1.5 meters downstream of the regulating valve.

8.3 Outside temperature detector B2

This must be installed outside the building on the north or north-west side, at at least three meters from the ground protected from direct sunlight, and as far as possible from windows, doors, chimneys or other sources of thermal disturbance.

8.4 Ambient temperature detector B3

This must be installed at a point which represents the average temperature of a significant space (eg living room) at a height of 1.5 ... 1.6 meters from the floor, on an internal wall as far as possible from windows, doors and sources of heat ; corners, shelving and curtains should be avoided.

8.5 Boiler detector B4

This must be used with boilers provided with anticondensing pump and must be installed on the flow piping of the boiler between the boiler itself and the anticondensing pump connector.

8.6 DHW temperature detector B5

This must be installed on the DHW storage boiler, preferably on the lower part (1/3 height) using cable-type detectors for deep pockets.

9. WIRING

Proceed as follows :
• Separate the base and cover
• Mount base on DIN rail and check that the securing elements (5.4) hold it firmly in place.
• Carry out the wiring according to the diagram and in observance of the regulations in force, using cables of :
– 1,5 mm^2 for power and relay control outputs
– 1 mm^2 for detectors and remote control
– 1 mm^2 for C-Bus and C-Ring. For limits of cable length please see technical data sheets T 021 and T 022
• Switch on power (230 V ~) and check the voltage across terminals L and N
• Switch off power, replace cover on base and secure it with the four screws supplied (5.3).

You are advised not to insert more than two cables in a single terminal of the controller and if necessary to use external junction boxes.
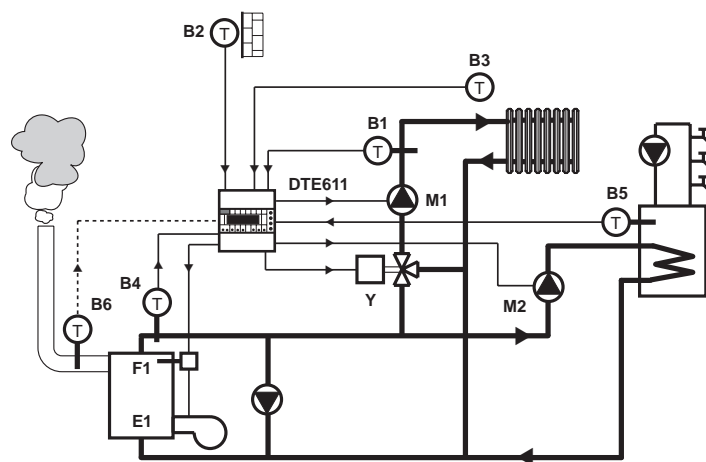
10. EXAMPLES OF BOILER PLANT CONTROL

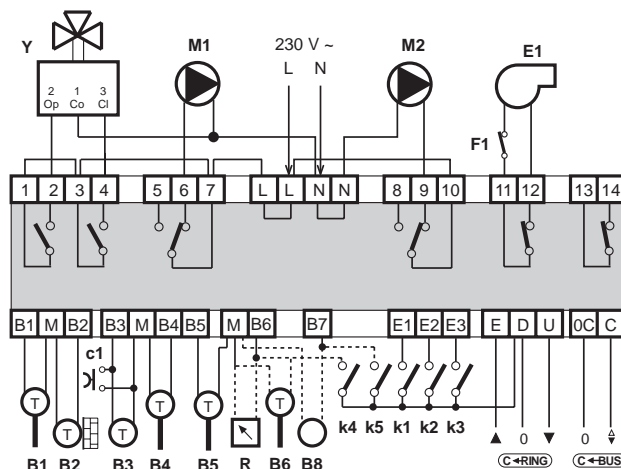## 10.1 Control of a single-stage boiler with compensated heating zone and DHW at constant temperature

27.1

Configuration : Type of Boiler
1BOILER 1STAGE

B1 – Plant flow temp.detector
B2 – Outside temp. detector
B3 – Ambient temp. detector
B4 – Boiler temp. detector
B5 – DHW temp. detector
B6 – Flue gases 1 detector (alternative to remote control R)
B8 – Active detector 4 ... 20 mA (alternative to B7 and k5)
E1 – Boiler
F1 – Boiler thermostats
k 1...3 – Alarm contacts

k4 – Alarm contact (alternative to remote control R)
k5 – Alarm contact (alternative to detector B8)
c1 – Remote Extension SPST switch
 L – Line 230 V ~
 N – Neutral
M1 – Heating pump
M2 – DHW pump or second timed output
 R – Remote control for modifying programmes
 Y – Motorised heating valve
C-Bus – Transmission telemanagement data
C-Ring – Transmission data between controllers

10.2 Control of a two-stage boiler with compensated heating zone and DHW at constant temperature

27.1

Configuration : Type of Boiler
1BOILER 2STAGES

B1 – Plant flow temp.detector
B2 – Outside temp. detector
B3 – Ambient temp. detector
B4 – Boiler temp. detector
B5 – DHW temp. detector
B6 – Flue gases 1 detector (alternative to remote control R)
B8 – Active detector 4 ... 20 mA (alternative to B7 and k5)
E1.1 – 1st stage boiler
E1.2 – 2nd stage boiler
F1 – Boiler thermostats
k 1...3 – Alarm contacts
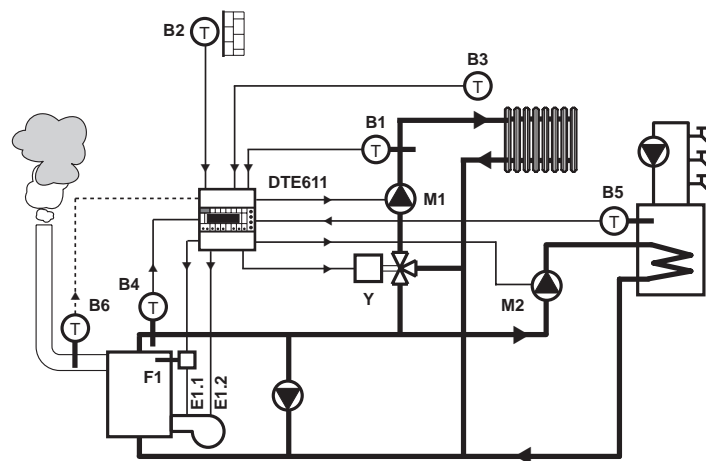
k4 – Alarm contact (alternative to remote control R)
k5 – Alarm contact (alternative to detector B8)
c1 – Remote Extension SPST switch
 L – Line 230 V ~
 N – Neutral
M1 – Heating pump
M2 – DHW pump or second timed output
 R – Remote control for modifying programmes
 Y – Motorised heating valve
C-Bus – Transmission telemanagement data
C-Ring – Transmission data between controllers

10. EXAMPLES OF BOILER PLANT CONTROL

10.3 Sequencing of two burners with compensated heating zone and DHW at constant temperature

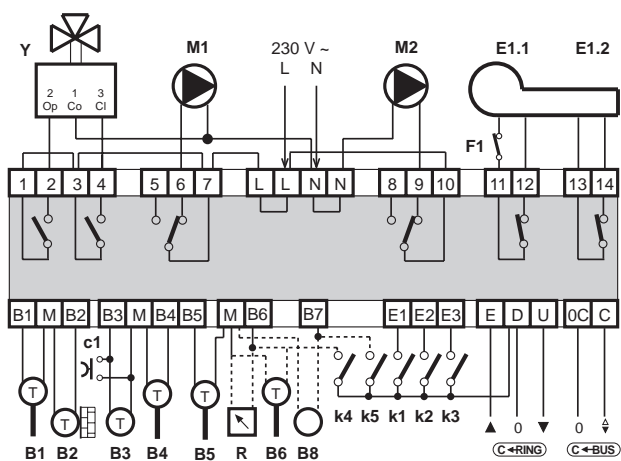**27.1**

Configuration :   Type of Boiler
2BOILERS IN SEQU

B1 – Plant flow temp.detector
B2 – Outside temp. detector
B3 – Ambient temp. detector
B4 – Boiler temp. detector
B5 – DHW temp. detector
B6 – Flue gases 1 detector (alternative to remote control R)
B7 – Flue gases 2 detector (alternative to detector B8)
B8 – Active detector 4 ... 20 mA (alternative to B7 and k5)
E1 – Boiler 1
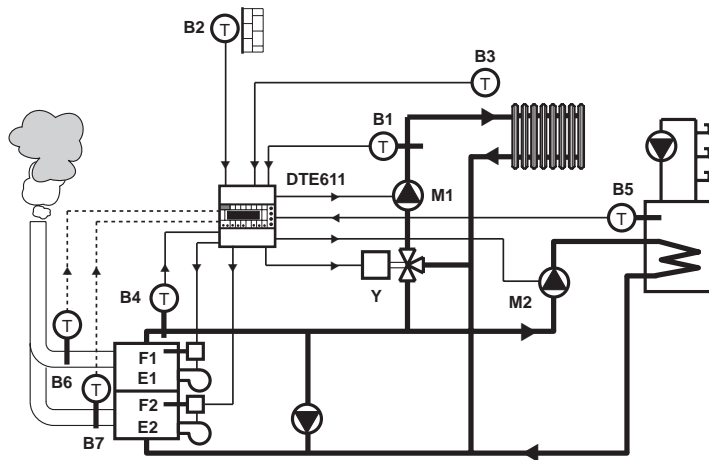E2 – Boiler 2
F1 e F2 – Boiler thermostats

k 1...3 – Alarm contacts
k4 – Alarm contact (alternative to remote control R)
k5 – Alarm contact (alternative to detector B8)
c1 – Remote Extension SPST switch
L – Line 230 V ~
N – Neutral
M1 – Heating pump
M2 – DHW pump or second timed output
R – Remote control for modifying programmes
Y – Motorised heating valve
C-Bus – Transmission telemanagement data
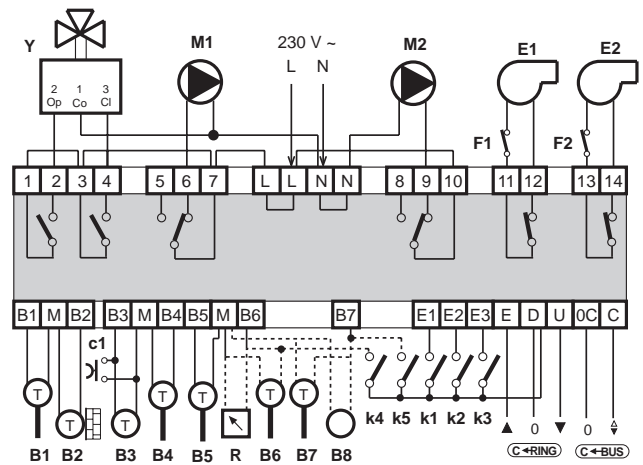C-Ring – Transmission data between controllers

11. COMMUNICATION

11.1 C-Ring : communication between controllers (for detailed information please see technical data sheet T 022)

DTC 611 controller is **always "Primary"** .
In the C-Ring the following signals are transmitted :
  – permission to operate as **Slave** controllers
  – value of the **outside temperature** (use of a single detector for several controllers)
  – value of **flow temperature** requested by zone controllers; used by "PRIMARY" controller for regulation temperature boilers (if scheduled).
  – **DHW priority** and/or **anticondensing** = closure valves heating zones with modulating control action.
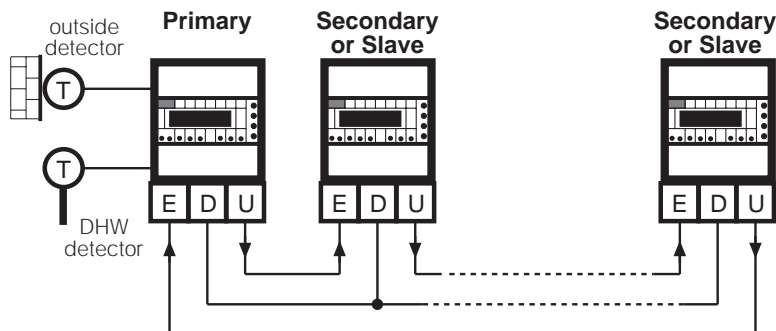
28.3

CRing Connection
NO

NO = connection to C-Ring not scheduled
YES= connection to C-Ring scheduled

11.2 C-Ring wiring diagram

11.3 C-Bus communication for telemanagement (for detailed information please see technical data sheet T 021)

By means of C-Bus output DTE 611 can be telemanaged : two-way transmission of data using one or more local PCs and / or remote central PC via telephone network.
From PC or PCs it is possible to display and/or change :
  – the data and values entered on display pages of the controller and those of configuration dedicated exclusively to telemanagment (see 4.TECHNICAL DATA)
  – operational status of plant components (pumps, auxiliaries in general)
  – acquire alarms coming from boiler plant
  – read the measurements of the detectors (temperatures : outside, flow, boiler, etc)

11.4 Address for telemanagment

28.2

Address :   1
Group   :   –

With telemanagement setup, in order to be identified by the central PC and/or by the local PCs, the controllers must have a progressive address number.
If required, it is also possible to subdivide the controllers in groups.

When telemanagement is not to be used it is not necessary to enter the address in memory (–)
To cancel the values keep + and – keys pressed at the same time.

11.5 Sending alarms

28.1

Send Alarms:NO
PassWTeleman:NO

• **Sending alarms** : NO = alarms not sent
                    YES= alarms sent to central PC and indicated by blinking of LEDs on controller.
• **PassWTeleman** : NO = keynumber disabled
                    YES= keynumber enabled

11.6 Recording data

The controller can memorise 32 series of all the operational data of the heating zones controlled.
The last recording brings about the cancellation of the oldest one.
The recordings take place automatically at a change of mode brought about either by the timed programme or by the operator.

11.7 C-Bus wiring diagram
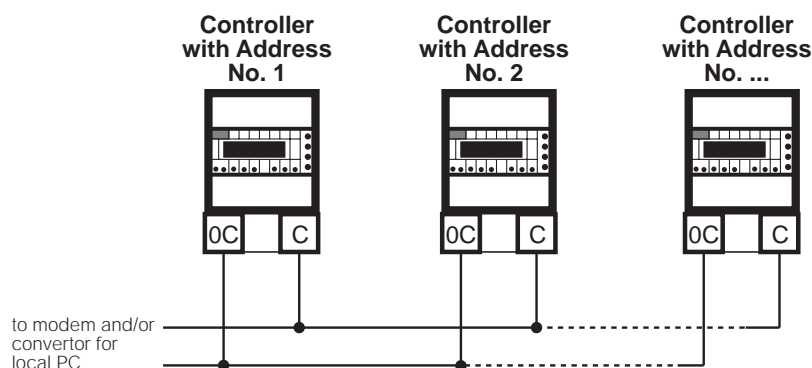
12. OPERATION

DTE 611 is a digital controller with microprocessor designed for :
– compensated control, or at a constant value, of a boiler with single-or two-stage burner or two single-stage burners in sequence (without shut-off valves).
– compensated control, with or without ambient authority, of the heating zone. Three-wire control of motorised valve and On-Off control of pump.
– control of temperature at a constant value (or according to a timed programme) of a secondary zone for DHW, fan coils etc. On-Off control of plant component.
– acquisition of status and / or alarms regarding plant components.

To configure the controller please see 21. SEQUENCE OF DISPLAY PAGES.

13. BOILER

13.1 Configuration of type of plant boiler & burner

27.1

```
Type of Boiler
1BOILER 1STAGE
```

– 1 BOILER 1STAGE   = boiler with single-stage burner
– 1 BOILER 2STAGES = boiler with two-stage burner
– 2 BOILERS IN SEQU = 2 boilers with single-stage burner in sequence (without shut-off valves) or 1 boiler with 2 single-stage burners in sequence.

13.2 Operating mode

23.14

```
Operation Boiler
AUTOMATIC
```

Choice of type of operation of boiler(s) :
– ALWAYS ON   = control of burner(s) by boiler thermostats. Emergency or temporary operation for special needs.
– AUTOMATIC   = detector B4 is indispensable (see 7. WIRING DIAGRAM). Control by controller of burner(s) according to type of boiler plant.
• 1 boiler 1stage   = start/stop of burner according to differential.
• 1 boiler 2 stage   = start/stop in sequence of stages of burner according to differential value set.
• 2 boilers in sequence = start/stop in sequence of the two single-stage burners each according to differential value set.
Possibility of setting operation of the two boilers in sequence :
– for fixed sequence 1 - 2.
– or fixed sequence 2 - 1.
– for automatic sequence = inversion sequence every 100 hours.

Minimum operating time of burners = 1 minute (cannot be changed)

13.3 Differential boiler

27.4

```
Differential
Boiler  :   5.0c
```
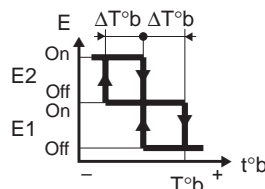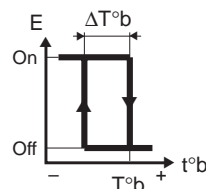

E   = boiler
E1   = boiler 1 or 1st stage
E2   = boiler 2 or 2nd stage
$\Delta T°b$ = differential in °C
T°b   = desired temperature boiler
t°b   = actual temperature boiler

The differential is the difference in temperature required to bring about the start / stop of a single-stage burner or the sequencing of each of the two stages or of the two single-stage burners.

13.4 Control of the temperature

The operation of the boiler can be configured for the control of temperature at :

27.2

```
Control Boiler
FIXED POINT
```

27.3

```
Desired Boiler
Temp   : 80.0c
```

27.2

```
Control Boiler
COMPENSATION
```

– FIXED POINT   = Control with constant temperature at value set

– COMPENSATION = Control with variable temperature in relation to outside temperature. When DHW calls for heat (pump M2 On) the desired boiler temperature moves to the "FIXED POINT" value

With C-Ring setup the desired operating temperature will correspond to the highest among the temperature of its own controller and those coming from the controllers connected.

13.5 Increase in the curve (only with COMPENSATION control of boiler)

To ensure that with compensation the boiler is always able to meet the request from the heating zones it is necessary to increase the value of the maximum temperature requested.

27.3

```
Increase BoilerT
on Htg  :   5.0c
```

13.6 Maximum and minimum limits (only with COMPENSATION control of boiler)

27.5

```
Boiler T Limits
Min: 1c  Max: 99c
```

Both the limits enter into the calculation of the boiler operating temperature.
When the boiler temperature reaches one of the limit values it is kept constant at that value (the controller no longer considers the maximum temperature requested).

WARNING: the maximum limit does not substitute observance of the safety regulations in force.

13.7 Operation with heating Off

23.15

```
Boiler with
Heating:OFF
```

The status of the boiler when the plants are turned off (including those in C-Ring) can be configured for :
- – ON = boiler always in operation, and in particular :
  - • with compensation = at the minimum limit temperature set
  - • at fixed point = at the temperature set in 27.3
- – OFF = burners Off, but in relation to the normal operating temperature (fixed point or compensated) on request for heat :
  - – from DHW
  - – from heating zone of controller
  - – from controllers connected in C-Ring.

Safety of operation:
Boiler in operation controlled by own thermostats if :
- *– short or open circuit of detector B4*
- *– break in C-Ring (if connected)*

13.8 Eco Off

23.16

```
Eco Off
NO
```

If configured "*PLANT + BOILER*", this function brings about the switching off of the boiler.
For further details please see "Eco Off" (14.8).

13.9 Control for outside temperature (only with 1 boiler 2 stages or two boilers in sequence)

27.7

```
Off Stage 2: NO
Outside T:  3.0c
```

For operation with reduced thermal load in intermediate seasons.
- • *Off stage 2 : NO* = function excluded
  - *YES* = 2nd stage or 2nd boiler excluded when outside temperature exceeds value set.

13.10 Metering of operating hours

25.7

```
Boiler1:xxxx hrs
Boiler2:xxxx hrs
```

The controller memorises the lengths of time the stages or the two burners remain On.
Permits making a good approximation of fuel consumption thereby enabling rationalisation of fuel deliveries.
To cancel the value keep pressed + and – keys at the same time.

14. HEATING ZONE

14.1 Type of installation

26.1

```
Heat Emitters
RADIATORS
```

The controller must be configured according to the type of installation :
- • *Type installation :*   RADIATORS
  - PANELS
  - FAN COILS

14.2 Heating control

The flow temperature requested by the controller (detector B1) is adjusted in relation to the o*utside* temperature (detector B2 or value transmitted via C-Ring) and to the *heating control curve.*
The controller compares the actual value of the flow temperature with the corresponding one on the curve and, if there is a difference, regulates, with PI control action (proportional band Pb and integral time It set) the motorised valve to eliminate the difference.
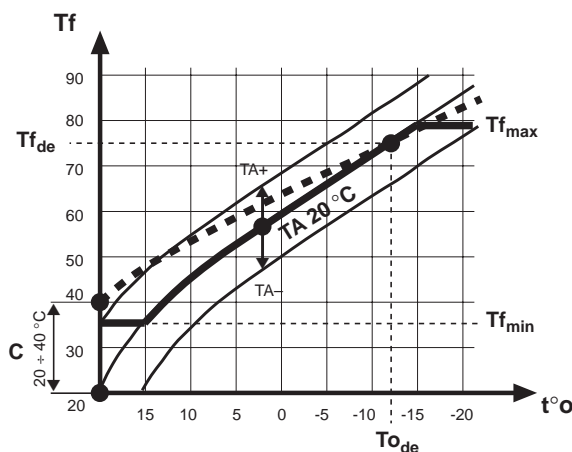
C = correction curve origin
$T°f$ = desired flow temperature
$T°f_{de}$ = design winter flow temperature
$T°o_{de}$ = design winter outside temperature
$T°f_{max}$ = winter maximum flow limit
$T°f_{min}$ = winter minimum flow limit
$t°o$ = outside temperature

The *heating control curve* , referring to a desired ambient temperature of 20 °C, is established by :

26.2
```
Design Outside
Temp     :- 5.0c
```

26.3
```
Design Flow
Temp     : 70.0c
```

• *design outside temperature* , used for calculation of winter heat loss from building ; depends on the climatic area in which the building is situated.

• *design flow temperature* , used for determining thermal requirements of heating zone (eg: radiators = 70 °C, fan coils = 80 °C, panels = 40 °C).

• *origin of heating curve* = winter flow temperature with outside temperature of 20 °C.

The flow temperature requested by the controller depends also on the value of the *ambient temperature requested* by the operating mode *Normal ,Setback , Frost Protection* (parallel ± shift of curve).

14.3 Origin of heating curve

26.4
```
CurveOrigin TO20
Flow T    : 20.0c
```

The conventional point of origin of the heating curve (+ 20 °C flow at + 20 °C outside) can be adjusted by an increase in the flow temperature (max. + 20 °C).
The adjustment may be necessary to avoid possible imbalances in the output of the heat emitters with high outside temperatures (intermediate seasons).

14.4 Operating temperatures

23.1-23.5
```
Desired Temp
NORMAL  1  20.0c
```

23.6-23.7
```
Desired Temp
SETBACK 1  16.0c
```

23.8
```
Desired Temp
FROSTPROT   6.0c
```

23.9-23.10
```
Desired Temp
FLOW   1  20.0c
```

DTE 611 permits the configuration, even with different values of desired temperature, of the various operating modes available, namely is :

– 5 NORMAL = operation of compensated control at comfortable ambient temperatures (during the day or when building occupied)

– 2 SETBACK = operation of compensated control at reduced ambient temperatures (at night or when building not occupied)

– FROST PROTECTION = operation of control at safety temperature (holidays or building unoccupied)

– 2 FLOW = operation of control at constant flow temperature value (compensation curve not taken into account)

– OFF = valve closed and pump idle

14.5 Minimum and maximum limits of flow temperature

26.5
```
Flow T Limits
Min: 1c  Max:99c
```

When the requested flow temperature reaches one of its limit values it is kept constant at that value.
   Examples : - minimum limit to avoid circulation of cold air in fan coils.
                    - maximum limit to avoid dangerous overheating of the panels.

Warning :   *the maximum limit temperature does not substitute observance of the safety regulations in force.*

14.6 Actuator run time
26.6
```
Control: VALVE
Time :    630sec
```

This is the time for a complete run (open/closed) of valve actuator, **necessary** for correct control operation.

14.7 Ambient authority

26.7
```
AmbientAuthority
on Flow   :————c
```

When ambient detector B3 is connected, the controller is able to adjust the desired flow temperature according to the ambient authority set.
When detector B3 is not connected the adustment takes place only in the S*etback/Frost Protection* modes using the value of the ambient temperature calculated in relation to the cooling time constant.

• *Ambient authority on flow* = value in °C of change (increase/decrease) in flow temperature for each degree of difference in ambient temperature.

14.8 Eco Off

Permits excluding heating when the weather conditions do not require it :

23.16
```
Eco Off
NO
```

– NO = not enabled
– ECO PLANT = enabled only for heating (valve closed & pump idle)
– P + B = enabled for heating and boiler (the boiler starts at request of DHW or of C-Ring).

Functions only in *Normal / Setback* modes for :
Tf – Taa ≤ 2°C   Tf = flow temperature calculated by compensation control
         Taa = actual or calculated ambient temperature
Function ceases and returns to automatic operation when the difference is ::
Tf – Taa ≥ 4°C

14.9 Operating programmes

22.2

```
Htg:------------
24HOUR         1
```

Choice of operating programme for heating zone according to requirements :
– *24 HOUR1...7; – 7 DAY 1 - 2, – NORMAL 1...5; – SETBACK 1 - 2; FROSTPROT;*
– *FLOW 1 - 2; OFF*
In place of the programme the following can appear :
– *SUMMER =* controller is in summer period;
– *HOLIDAY =* controller is in holiday period;
– *SPECIAL =* controller is in special period;
– *REMOTE EXTENSION =* the "Remote Extension" period has been activated.
   To cancel this function, on first page press at the same time ← and → keys.
– *REMOTENORMAL 1 =* remote control "R" is in "Normal" position;
– *REMOTESETBACK* 1 = remote control "R" is in the "Setback" position;
– *REMOTEFROSTPROT =* remote control "R" is in the "Frost Protection" position;
– *REMOTE OFF =* remote control "R" is in the "Off" position;
– *REMOTE+2c =* remote control "R" is in the "Automatic + 2 °C" position.

14.10 Operating mode & adjustment of temperature

22.1

The mode in use depends on the programme set in
```
Htg:------------
24HOUR         1
```
and is shown on the page of display

22.3

```
Mode:  NORMAL
Td21.0c  Var+0.0c
```

• *NORMAL*   Td - -.- c
   SETBACK   Td - -.- c
   FLOW   Td - -.- c
   FROSTPROT   Td - -.- c
   OFF
In the NORMAL / SETBACK operating modes it is possible to make an adjustment to the desired temperature value :
• *Var +* = variation of ± 3°C

14.11 Remote control for modifying programmes

28.4

```
Input B6
REMOTE  CONTROL
```

The remote control R (CDB 300) can be used as an alternative to flue gases detector B6 (see "Complementary functions"). It allows modifying from a distance the operating programme in use:
– *OFF*   : plant excluded.
– *FROSTPROT*   : continuous operation at desired *Frostprot* ambient temperature
– *NORMAL*   : continuous operation at desired *Normal 1* ambient temperature
– *SETBACK*   : continuous operation at desired *Setback 1* ambient temperature.
– *TAd +2c*   : increase of 2 °C in desired temperature of mode in use.
– *AUTOMATIC*   : operation with chosen programme on controller.

14.12 Control plant pump

26.15

```
Heating  Pump:AUT
Delay  Off:30min
```

The heating plant pump can be controlled in two ways :
• *Pump :*   MAN   = pump always in operation.
         AUT   = pump controlled by event times of programme in use.
• *Delay Off :*   - - min = delay in switching off for dissipating heat accumulated in plant.

14.13 Metering degree-days

25.8

```
Degree-Days
20:xxxx  Amb:xxxx
```

DTE 611 carries out a double metering of degree-days :
• *20*   = metering of degree-days with reference to conventional ambient temperature of 20 °C.
• *Amb* = metering of degree-days with reference to actual ambient temperature (with detector
        B3) or to that calculated (without B3).

15. OPTIMISATION

Start and stop at variable times so as to obtain the desired ambient temperature in coincidence with the times of start and end of occupancy.
Useful for buildings with discontinuous occupancy such as : schools, business and public offices.
The method for establishing the time of optimised start depends on the presence or not of the ambient detector.

15.1 Optimisation with ambient detector

The start time is established by the meeting point of the descending curve of the actual ambient temperature (with plant OFF or in SETBACK/FROSTPROT mode) and the ascending of ambient temperature curve defined by the parameter "*Start inertia* ".
With "*Start inertia* " on AUTOMATIC (15.4) : if the desired ambient temperature is obtained too soon or too late in respect of the required time, the controller corrects the start time for the following day by ± 15 minutes until the desired time is obtained.

15.2 Optimisation without ambient detector

"Start inertia" must be set on MANUAL in 15.4 . The start time is established by the controller on the basis of the *"Cooling time constant"* (26.12).

15.3 Enabling of the function

23.17

```
Optimum Start  :NO
Optimum Stop   :NO
```

• *Optimum start* = automatic change of start time of plant after night shutdown/SETBACK or after the holidays.
  – *NO* = function disabled
  – *YES* = function enabled
• *Optimum stop* = stop before programmed end of NORMAL (day) mode.
  – *NO* = function disabled
  – *YES* = function enabled

WARNING: *The functions are not enabled in the FLOW 1- 2 modes and are operative only for the first and last events of the programme.*

15.4 Start inertia

26.8

```
Start  Inertia
MANUAL   1.00h/c
```

Time necessary (hours / °C) for plant to increase ambient temperature by 1 °C.
  – *MANUAL* = the value can be adjusted only manually.
  – *AUTOMATIC* = only with ambient detector. The value is adjusted automatically by ± 15 minutes per day.

15.5 Duration of normal optimisation

26.9

```
Opt Start Normal
Max Durat: 2.00h
```

Maximum period before start occupancy for first startup of plant , when controller uses one of 7-day and/or 24-hour programmes available ; in practice, startup after being shut down at right.

15.6 Duration of optimisation holidays

26.10

```
OptStart Holiday
Max Durat:10.00h
```

Maximum period before start occupancy for first startup of plant after a holiday period.

15.7 Boosting

26.11

```
Optimum Start
Boosting :  3.0c
```

Increase in desired ambient temperature, with consequent increase in flow temperature, during period of optimum start, so as to reduce the time for heating zone to reach required temperature. With ambient detector, if desired ambient temperature is reached before desired time, the controller changes to compensation as per programme.

15.8 Cooling time constant

26.12

```
Cooling Time
Constant: 48 hrs
```

Time taken by ambient temperature, with plant Off, to fall by 2/3 its initial value. It is used by the controller to calculate the ambient temperature (in SETBACK / FROSTPROT modes) when the plant is without ambient detector.

15.9 Reduction of temperature for optimum stop

26.13

```
Optimum Stop
DecreaseTA: 0.5c
```

Maximum reduction of ambient temperature permitted at time of end of occupancy in respect of desired temp. on condition that ambient temperature is below value set in respect of that of mode in use at end of occupancy.

This function is not enabled in the FLOW 1 - 2 modes and is performed only at the last event of the programme.

15.10 Maximum optimum stop

26.14

```
Optimum Stop
Max Durat: 1.00h
```

Maximum period before programmed end of occupancy for shutdown of plant. The time is calculated in relation to the reduction in temperature set in 26.13 with ambient detector and to the *"Cooling time constant"* without ambient detector. With ambient detector : if ambient temperature falls, in respect of value of the reduction set, before the time of end of occupancy, the controller returns to operate according to the programme.

(**COSTER**)

16. CONTROL DHW

28.7

```
Detector Alarms
– – – 5 – – –
```

When detector B5 is connected and is enabled in "*Detector Alarms*", the controller regulates DHW pump M2 according to operating programme selected and desired temperature set.
If the presence of the detector is disabled in "*Detector Alarms*", whether detector B5 is connected or not, the output can be used for **timed control**.

16.1 Desired temperature

23.11

```
Desired Temp
DHW      50.0c
```

Value of temperature desired for DHW storage.

16.2 Differential & antibacteria

26.17

```
DHW Differ: 3.0c
Antibacteria:NO
```

- *DHW Differ* = difference of temperature for control of DHW pump M2.
- *Antibacteria* = increase in DHW temperature to 70° for 90 minutes every Wednesday at 12 noon to prevent formation of bacteria inside the storage tank.
  - *NO* = function disabled
  - *YES* = function enabled

16.3 Operating programmes

23.12

```
DHW Summer  :YES
ALWAYS ON
```

- Operation of DHW during summer period :
  - *YES* = DHW operating
  - *NO* = DHW Off
- Choice of operating programme:
  - *24HOUR 1...7; – 7DAY 1 - 2, – FOLLOWS HEATING;*
  - *ALWAYS ON; – ALWAYS OFF;*

NB: if "*FOLLOWS HEATING*" set and "*DHW summer*" : *YES*", DHW in summer is, however, switched off.

16.4 Operating modes

DHW control uses one of the programmes available on the controller.
It is important to note that when a 24-hour programme is prepared specifically for DHW, the operating modes available have the following significance :

23.11

```
Desired Temp
BOILER    50.0c
```

23.8

```
Desired Temp
FROSTPROT  6.0c
```

- NORMAL 1...7; SETBACK 1 - 2 ; = *ON (On)*   = desired T DHW

- FLOW 1 - 2; FROSTPROT; OFF = *OFF (Off)*   = desired T DHW

The same also applies when the operating programme of DHW is "*FOLLOWS HEATING*".

16.5 Delay switching off pump

26.16

```
DHW Pump
Delay Off:NO
```

Delay in switching off DHW pump when desired DHW temperature is reached :
- *NO* = no delay
- *YES* = delay in switching off 5 minutes fixed.

17. PROGRAMMES & PERIODS WITH DATES

All the timed programmes are available both for compensated control and for the control of DHW. The periods with dates refer to compensated control and are followed for the control of DHW only if this is programmed as "*FOLLOWS HEATING*".

17.1 24-hour programmes

24.1

```
How many 24hour
Programmes  ? 1
```

Set the number of 24-hour programmes you wish to use (1 ... 7).

In each 24-hour programme (**P1 ... P7**) you can set a maximum of 6 event start times (**Event 1 ... Event 6**) assigning to each one of modes :

24.2

```
P1 Event 1 06.00
NORMAL  3   21.0c
```
⇩
24.7

```
P1 Event 6 22.00
SETBACK 1  16.0c
```

- *NORMAL 1...5* = compensated control with NORMAL ambient temperature
- *SETBACK 1 - 2* = compensated control with SETBACK ambient temperature
- *FLOW 1 - 2* = control with fixed FLOW temperature
- *FROSTPROT* = compensated control with FROSTPROT ambient temperature
- *OFF* = plant Off, valve closed & pump idle

The event start times must be entered in increasing order.
The events not used must be excluded by pressing + and – keys at the same time (– – –).
You must not leave unused events (– – –) between programmed events.

17.2 7-day programmes

24.8

```
How many 7day
Programmes ?   0
```

24.9

```
7day 1 MONDAY
24HOUR        1
```
⇓
⇓

24.15

```
7day 1 SUNDAY
24HOUR        1
```

Enter the number of programmes you wish to use (max. 2).

In each 7-day programme you can assign to each day of the week one of following programmes :

– *24HOUR 1 …7;*
– *NORMAL 1 ... 5;*
– *SETBACK 1 - 2 ;*
– *FLOW 1 - 2 ;*
– *FROSTPROT;*
– *OFF.*

17.3 Holiday periods

24.16

```
How many Holiday
Periods    ?   0
```

24.17

```
Holiday Program
FROSTPROT    6.0c
```

24.18

```
Hol 01 start   NO
Fr --.--to --.--
```

Set an operating programme, the same for all periods, which overrides the one in use. At the end of each holiday period the controller returns to normal operation.

Enter the number of holiday periods or of bank holidays you wish to use (max. 25) so as to reduce the number of display pages dedicated to the entering of the dates.
If left at 0 the programming pages do not appear.

Choose the programme to be used during *all the holiday periods* :

– *7DAY 1 - 2;* – *24HOUR 1 …7;* – *NORMAL 1 ... 5;* – *SETBACK 1 - 2;*
– *FLOW 1 - 2;* – *FROSTPROT ;* – *OFF.*

Enter the dates of each single period :

24.16

```
How many Holiday
Periods    ?  --
```

• Hol 01   = selection of the periods available from
• Start :   – *NO* = holiday period not used
            – *00* = start period at 00.00 hours
            – *12* = start period at 12.00 hours
• Fr - - . - - to - - . - - = day and month of start and end of holiday period.

For a single day of holiday enter the same date for start and end.
To cancel a holiday period keep pressed the + and – keys at the same time.

17.4 Special period

22.5

```
Special Program
24HOUR        1
```

22.6

```
Special Period
Fr --.--to --.--
```

Period in which compensated control has to follow an operating programme, which overrides temporarily that in use, to meet special requirements :

– *7DAY 1 - 2; – 24HOUR 1 …7; – NORMAL 1 ... 5; – SETBACK 1 - 2;*
– *FLOW 1 - 2; – FROSTPROT ; – OFF.*

It also applies to control of DHW if "*FOLLOWS HEATING*" has been configured (see 16. CONTROL DHW).

Enter the day and month of start and end of the special periods.

17.5 Extension period

23.13

```
Remote Ext 21.0c
for hours       3
```

The Extension period overrides all the programmes and modes in use, causing the heating to operate for the time and at the temperature entered.
To activate the Extension period, close the switch c1 for at least five seconds and then open it. At the expiry of the hours set the controller will resume its automatic operation.

• *Remote Ext 21.0c* =entering desired ambient temperature during Remote Extension period.
• *for hours : 3* =entering duration in hours of Remote Extension period.

To stop the Remote Extension period before the time entered has expired press ← and → keys at the same time.

17.6 Heating Season

24.19

```
Heating Season
Fr --.--to --.--
```

Establishes the winter season heating period.
Enter the day and month of start and end of *heating season* .

23.12

```
DHW Summer : YES
ALWAYS ON
```

23.15

```
Boiler with
Heating:OFF
```

Applies also to DHW if "DHW summer : NO" selected in

In summer period the boiler is excluded if OFF selected in

To cancel the period keep pressed + and – keys at the same time.

17.7 Summer time

24.20
```
Summer  Time
Fr 29.03to 26.10
```

The controller automatically changes the actual time in relation to the summer time period.
– *Fr - -.- -* = the night of the last Saturday in March the clock is automatically put forward one hour
– *to - - .- -* = the night of the last Saturday in October the clock is automatically put back one hour

To cancel the period keep + and – keys pressed at the same time.

17.8 Summer plant exercise

23.18
```
Summer  Plant
Exercise   NO
```

This function prevents lockouts of valve and pumps during long periods of inactivity.
– *NO:* function excluded
– *YES:* • Heating circuit : every Sunday at 11.00 valve is opened for 15 minutes and at 12.00 noon pump is switched on for 5 minutes.
• DHW circuit : If excluded in summmer, every Sunday at 12.00 noon pump is switched on for 5 minutes.

18. COMPLEMENTARY FUNCTIONS

18.1 DHW priority & anticondensing

27.6
```
DHW Priority &
Anticondens : NO
```

The same function controls anticondensing and DHW priority :
– *NO*   = function excluded
– *YES* = When boiler temperature (measured by detector B4) falls by three times the differential set in respect of the desired value, the controller closes the heating valve with modulating control action.
The DHW pump functions only when actual boiler temperature exceeds by 3 °C actual DHW temperature.

18.2 Input B6

28.4
```
Input    B6:
FLUGAS + ALARM
```

Configuration of detector B6 input :
– *FLUGAS + ALARM*   = if flue gases detector Pt 1000 and / or an alarm contact is connected
– *REMOTE CONTROL* = if remote control CDB 300 is connected

18.3 Input B7

28.5
```
Input    B7:
FLUGAS + ALARM
```

Configuration of detector B7 input :
– *FLUGAS+ ALARM* = if flue gases detector Pt 100 and / or an alarm contact is connected
– *4...20mA*   = if an active detector for various measurements (levels, etc) is connected

18.4 Access keynumber

28.9
```
Choice Keynumber
     - - - -
```

Choice and enabling of access keynumber which prevents any modification of data by means of + and – keys. Enter the number (1900 ... 1999) using + and – keys.
To cancel keynumber press + and – at the same time until the dashes reappear.

```
Access Keynumber
     - - - -
```

When keynumber is enabled, if + or – keys pressed there will appear on the display a request to enter keynumber. Only after having entered the exact keynumber can + and – keys be used.
If for 15 minutes no key is pressed the keynumber is automatically re-enabled.

18.5 Name site (plant)

28.10
```
NameHeatingPlant
 - - - - - - - - -
```

Entering name of site (plant) which appears on first page of display.
Each dash can be replaced, using + and – keys, by a letter of the alphabet (A ... Z) or by a digit (0 ... 9). The ← and → key serve to position the cursor.

18.6 Display measurement

25.1
```
Des Amb T :21.0c
Act Amb T :21.0c
```

The controller displays all the values measured by the detectors and the data which serves to monitor the operational status of the plant :

• **ambient temperature** *requested* by mode in use and *actual* measured by detector B3.
If detector B3 is not connected, in place of *Act Amb T* appears *Cal Amb T*.

25.2
```
Des Flow T:65.0c
Act Flow T:64.0c
```

• **flow temperature** *requested* by mode in use and *actual* measured by detector B1.

25.3
```
Outside Temp
Actual    :- 2.0c
```

• *actual* **outside temperature.** If detector B2 is not connected to controller, in place of "actual" will appear "C-Ring" and the value is that coming via C-Ring.

25.4
```
Des DHW T :50.0c
Act DHW T :58.0c
```

• **DHW temperature** *requested* by mode in use and *actual* measured by detector B5.
If detector B5 not connected there will appear *Act DHW T : - - - - c*

25.5
```
DesBoilerT:70.0c
ActBoilerT:67.0c
```

• **temperature boiler** *requested* by mode in use and *actual* measured by detector B4.
If detector B4 not connected there will appear *Act BoilerT : - - - - c*

25.6
```
Flugas1Max: 185c
Flugas2Max: 190c
```

• **max temperature flue gases** measured by detectors B6 and B7.
– if input B6 is configured as "REMOTE CONTROL" there will appear " B6 : REMOTE" instead of *Flugas 1*
– if input B7 is configured as "4 ... 20mA" there will appear "B7 : 2.0mA" instead of *Flugas 2*
To cancel the measurements press + and – keys at the same time.

18.7 Recording data

For each plant controlled, at each change of mode and every two hours, the controller records a series of data indicating the operational status of the plants controlled :

– Current time, current day, type of recording (change of mode or end of two-hour period); current mode, actual outside temp.,compensated flow temp., desired and actual flow temp., desired and actual ambient temp., anticondensing temperature.
– Status output relays.

It is able to memorise 28 complete recordings. The last recording brings about the cancellation of the oldest one.

If the first page is not displayed the controller makes the recording at the end of the two-hour period but not the recording at the change of mode because it presumes changes to the setting data are in progress.

The recordings can be viewed only by the telemanagement computer.

19. ALARMS

The alarms processed by the controller are of three types :
– alarms for abnormal functioning of the controller and of the heating zones controlled;
– alarms for short or open circuits of the detectors connected;
– alarms from external contacts.

The alarm status is indicated by the LEDs on the controller facia and is identified, on the page "*Detector Alarms* ", by the letter "A" alternating with the number of the alarm concerned.

With the C-Bus setup alarms can be sent to a local PC and / or to the telemanagement central PC.

19.1 Functional alarms

The functional alarms are triggered in the presence of prolonged differences between actual measured values and those desired.
These alarms, with the exception of the real time clock alarm (8), do not affect the operation of the controller

28.6

```
Functional Alarms
– – – – – – – 8
```

Factory setting : all disabled except for real time clock alarm (8).
With + and – keys enable the alarms required by replacing the dashes with numbers.

When the number blinks = alarm triggered

The limit values and delay times for sending the alarms can be changed only by PC.

Type and cause of alarm :
1 = difference temperature *heating flow* (B1)
   – enabled when pump M1 in operation
2 = difference temperature *boiler* (B4)
   – enabled when burner in operation
   – triggered when actual temperature below that desired
3 = difference *ambient te*mperature (B3)
   – enabled with NORMAL modes and with outside temperature below desired ambient temperature.
   – triggered when actual temperature below or above that desired.
4 = boiler overtemperature (B4)
   – triggered when actual temperature above maximum limit temperature
5 = DHW temperature (B5)
   – enabled when pump M2 in operation
   – triggered when actual temperature below desired temperature
6 = flue gases 1 temperature (B6)
   – enabled if input B6 is configured as *FLUGAS + ALARM*
   – triggered when actual temperature above maximum limit temperature
7 = flue gases 2 temperature or active detector 4 ... 20mA (B7)
   – enabled according to configuration of input B7
   – triggered when actual temperature above maximum limit temperature or when actual measurement 4 ... 20mA exceeds for at least one minute the minimum or maximum thresholds set
8 = internal real time clock (*cannot be disabled*)
   – triggered when clock assumes meaningless values.

19.2 Detector alarms

The detector alarms are triggered in the event of **short or open circuits**.

28.7

```
Detector Alarms
1 2 3 4 5 6 7 8
```

Using + and – keys, disable unrequired alarms replacing the numbers with dashes.

Type of alarm and effect :

COSTER

1 = *flow de*tector (B1) with short or open circuit :
– valve stops where it happens to be and pump M1 maintains its status (idle or in operation)
2 = ou*tside* detector (B2) with short or open circuit :
– valve stops where it happens to be and pump M1 maintains its status (idle or in operation)
In C-Ring last value continues to be transmitted
3 = *ambient* detector (B3) with short or open circuit :
– with pump M1 in operation, ambient temp. = desired ambient temp. With pump M1 Off, value
of ambient temp. calculated by controller.
4 = *boiler* detector (B4) with short or open circuit :
– boilers operate with own thermostats ; anticondensing function disabled.
5 = *DHW* detector (B5) with short or open circuit :
– pump M2 idle
6 = *flue gases 1 (*B6) detector with open circuit
– alarm
7 = *flue gases 2 (*B7) detector with open circuit
– alarm
8 = C-Ring : open circuit or faulty controller, in ring.

The effect of the alarm situation is delayed by a minute.
Factory setting : or allarms enabled

19.3 Alarms or status by external contacts (K)

28.8

```
K  Alarms
–  –  –  –  –
```

Alarms triggered by the closure of voltage-free contacts **k1 ... k5** by the plant components (pumps, burners, etc).

The presence of the alarm is indicated after about 60 seconds.

Factory setting : all disabled.
Enable alarms of interest by replacing dashes by numbers using + and – keys.

When the number blinks = alarm triggered.
If not used as alarm they can be used as status indicators.

20. COMMISSIONING PLANT

Testing to be carried out on completion and testing of installation, wiring and configuration.

20.1 Testing C-Ring

The page of C-Ring testing appears only if configured *"YES"* in

28.3
```
CRing  Connection
        YES
```

Ensure that all the other controllers wired in C-Ring are :

29.1
```
CRing:??
```

– correctly powered by mains voltage (230 V ~)

– Slave controllers or configured as SECONDARIES in

28.3
```
CRing  Connection:
SECONDARY
```

– selected on testing page

29.1
```
CRing:??
```

The "PRIMARY" controller (Cont. 1) sends via C-Ring a signal every five seconds ; on all the displays appears "??". Each controller checks the incoming signal ; if the connection is positive the word "YES" replaces "??" on all the displays. If on one or more displays "YES" does not appear, this indicates that there is an open connection between the last controller with "YES" and the first with "??" ; or, in the event that "YES" does not appear on any display, this indicates that there is an open circuit between the first controller and the second.
Examples of testing a C-Ring circuit with four controllers :
– Cont.1 "YES" – Cont.2 "YES" – Cont.3 "YES" – Cont.4 "YES" : *C-Ring OK*
– Cont.1 "??" – Cont.2 "YES" – Cont.3 "YES" – Cont.4 "YES" : *Fault between 4 and 1*
– Cont.1 "??" – Cont.2 "YES" – Cont.3 "??" – Cont.4 "??" : *Fault between 2 and 3*
– Cont.1 "??" – Cont.2 "??" – Cont.3 "??" – Cont.4 "??" : *Fault between 1 and 2*

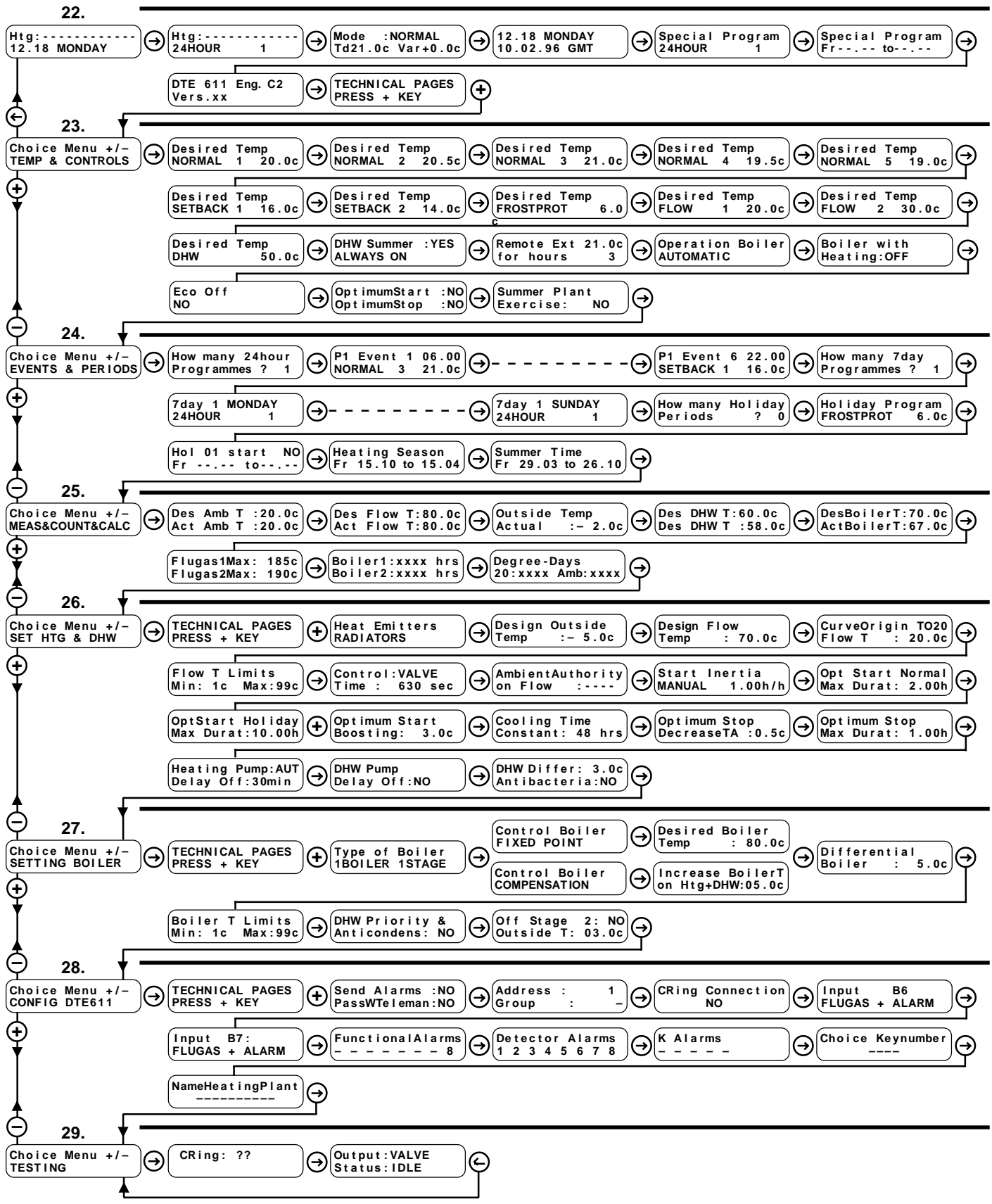### 20.2 Testing outputs

29.2
```
Output:VALVE
Status:IDLE
```

Using + and – keys, choose :
• output to be tested :
– *VALVE* ;
– *PUMP* ;
– *DHW*;
– *BOILER 1*;
– *BOILER 2*.
• status :
– with VALVE : *IDLE* ; *CLOSES* ; *OPENS*
– with *PUMP, DHW, BOILER 1, BOILER 2* : *ON or OFF*

Check the results.

21. SEQUENCE OF DISPLAY PAGES (the data and the functions are those in memory at time of delivery)

22.

| Htg:------------
12.18 MONDAY | → | Htg:------------
24HOUR   1 | → | Mode   :NORMAL
Td21.0c Var+0.0c | → | 12.18 MONDAY
10.02.96 GMT | → | Special Program
24HOUR   1 | → | Special Program
Fr--.-- to--.-- | → |

| DTE 611 Eng. C2
Vers.xx | → | TECHNICAL PAGES
PRESS + KEY | ⊕ |

23.

| Choice Menu +/-
TEMP & CONTROLS | → | Desired Temp
NORMAL 1 20.0c | → | Desired Temp
NORMAL 2 20.5c | → | Desired Temp
NORMAL 3 21.0c | → | Desired Temp
NORMAL 4 19.5c | → | Desired Temp
NORMAL 5 19.0c | → |

| Desired Temp
SETBACK 1 16.0c | → | Desired Temp
SETBACK 2 14.0c | → | Desired Temp
FROSTPROT   6.0c | → | Desired Temp
FLOW   1 20.0c | → | Desired Temp
FLOW   2 30.0c | → |

| Desired Temp
DHW   50.0c | → | DHW Summer :YES
ALWAYS ON | → | Remote Ext 21.0c
for hours   3 | → | Operation Boiler
AUTOMATIC | → | Boiler with
Heating:OFF | → |

| Eco Off
NO | → | OptimumStart :NO
OptimumStop :NO | → | Summer Plant
Exercise: NO | → |

24.

| Choice Menu +/-
EVENTS & PERIODS | → | How many 24hour
Programmes ? 1 | → | P1 Event 1 06.00
NORMAL 3 21.0c | → - - - - - - - → | P1 Event 6 22.00
SETBACK 1 16.0c | → | How many 7day
Programmes ? 1 | → |

| 7day 1 MONDAY
24HOUR   1 | → - - - - - - - → | 7day 1 SUNDAY
24HOUR   1 | → | How many Holiday
Periods   ? 0 | → | Holiday Program
FROSTPROT   6.0c | → |

| Hol 01 start NO
Fr --.-- to--.-- | → | Heating Season
Fr 15.10 to 15.04 | → | Summer Time
Fr 29.03 to 26.10 | → |

25.

| Choice Menu +/-
MEAS&COUNT&CALC | → | Des Amb T :20.0c
Act Amb T :20.0c | → | Des Flow T:80.0c
Act Flow T:80.0c | → | Outside Temp
Actual   :- 2.0c | → | Des DHW T:60.0c
Des DHW T :58.0c | → | DesBoilerT:70.0c
ActBoilerT:67.0c | → |

| Flugas1Max: 185c
Flugas2Max: 190c | → | Boiler1:xxxx hrs
Boiler2:xxxx hrs | → | Degree-Days
20:xxxx Amb:xxxx | → |

26.

| Choice Menu +/-
SET HTG & DHW | → | TECHNICAL PAGES
PRESS + KEY | ⊕ | Heat Emitters
RADIATORS | → | Design Outside
Temp   :- 5.0c | → | Design Flow
Temp   : 70.0c | → | CurveOrigin TO20
Flow T   : 20.0c | → |

| Flow T Limits
Min: 1c Max:99c | → | Control:VALVE
Time :   630 sec | → | AmbientAuthority
on Flow   :---- | → | Start Inertia
MANUAL   1.00h/h | → | Opt Start Normal
Max Durat: 2.00h | → |

| OptStart Holiday
Max Durat:10.00h | ⊕ | Optimum Start
Boosting: 3.0c | → | Cooling Time
Constant: 48 hrs | → | Optimum Stop
DecreaseTA :0.5c | → | Optimum Stop
Max Durat: 1.00h | → |

| Heating Pump:AUT
Delay Off:30min | → | DHW Pump
Delay Off:NO | → | DHW Differ: 3.0c
Antibacteria:NO | → |

27.

| Choice Menu +/-
SETTING BOILER | → | TECHNICAL PAGES
PRESS + KEY | ⊕ | Type of Boiler
1BOILER 1STAGE | → | Control Boiler
FIXED POINT | → | Desired Boiler
Temp   : 80.0c | → | Differential
Boiler   : 5.0c | → |
| | | | | | Control Boiler
COMPENSATION | → | Increase BoilerT
on Htg+DHW:05.0c | → | |

| Boiler T Limits
Min: 1c Max:99c | → | DHW Priority &
Anticondens: NO | → | Off Stage 2: NO
Outside T: 03.0c | → |

28.

| Choice Menu +/-
CONFIG DTE611 | → | TECHNICAL PAGES
PRESS + KEY | ⊕ | Send Alarms :NO
PassWTeleman:NO | → | Address :   1
Group   :   - | → | CRing Connection
NO | → | Input   B6
FLUGAS + ALARM | → |

| Input   B7:
FLUGAS + ALARM | → | FunctionalAlarms
- - - - - - - 8 | → | Detector Alarms
1 2 3 4 5 6 7 8 | → | K Alarms
- - - - - | → | Choice Keynumber
---- | → |

| NameHeatingPlant
---------- | → |

29.

| Choice Menu +/-
TESTING | → | CRing: ?? | → | Output:VALVE
Status:IDLE | ← |

⊖ ⊕ Keys for scrolling the pages on display and positioning the cursor ▮ on the data which can be changed.
The data which can be changed, in the following desriptive list of display pages, are highlighted thus
By pressing at the same time, or at any rate after 15 minutes, the first page returns to the display.

Htg:------------
12.18 MONDAY

⊖ ⊕ Keys for : – changing the values highlighteded by the cursor ▮
– viewing the configuration options of a function, for example :
– passing directly from one menu (series of pages) to another.

Heat Emitters
FAN COILS   or   Heat Emitters
PANELS

22. NORMAL USE

Ref.	Display	Description	Notes	Sect.
22.1	Htg:------------ 12.18 MONDAY	Name site (plant) Current time & day	Set in **28.10** Set in **22.4**	
22.2	Htg:------------ 24HOUR 1	Choice programme in use : *7DAY 1-2;* *24HOUR 1…7; NORMAL 1…5; SETBACK 1-2;* *FLOW 1-2; FROSTPROT; OFF.*	Instead of programme con appear : *SUMMER; HOLIDAY; SPECIAL;* *REMOTE EXTENSION; REMOTE NORMAL1;* *REMOTE SETBACK 1; REMOTE FROSTPROT;* *REMOTE OFF; REMOTE+2C.*	14.9
22.3	Mode:Normal Td21.0c Var+0.0c	Current mode. *Td*: Temperature desired by mode *Var* : Variation of desired temp. (max ± 3 °C)	Current mode : *NORMAL; SETBACK;* *FLOW; FROSTPROT; OFF; ECO PLANT;* *ECO P+B*	14.10
22.4	12.18 MONDAY 10.02.96 GMT	Setting : Time, day of week & date. Current time period : Summer or GMT	Dates summer time set in **24.20**.	
22.5	Special Program 24HOUR 1	Choice of programme for special period: *7DAY 1-* *2; 24HOUR 1…7;* *NORMAL 1…5; SETBACK 1-2; FLOW 1-2;* *FROSTPROT; OFF.*		17.4
22.6	Special Period Fr --.-- to --.--	Dates of start & end of special period.	Press + and – together cancel	17.4
22.7	DTE 611 Eng. C2 Vers.xx	Identifying data of controller		

23. TEMPERATURES & CONTROLS

Ref.	Display	Description	Notes	Sect.
23.1 23.5	Desired Temp NORMAL 1 20.0c	Value of desired NORMAL 1...5 ambient temp. to be used in 24-hour programmes in **24.2.**		14.4
23.6 23.7	Desired Temp SETBACK 1 16.0c	Value of desired SETBACK 1-2 ambient temp. to be used in 24-hour programmes in **24.2.**		14.4
23.8	Desired Temp FROSTPROT 6.0c	Value of desired FROSTPROT ambient temp. to be used in 24-hour programmes in **24.2.**		14.4
23.9 23.10	Desired Temp FLOW 1 20.0c	Vallue of desired FLOW 1-2 temp. to be used in 24- hour programmes in **24.2.**		14.4
23.11	Desired Temp DHW 50.0c	Value of desired DHW temperature		16.1
23.12	DHW Summer :YES ALWAYS ON	Use of DHW in summer period. Choice of programme to be used: *7DAY 1-2; 24HOUR 1…7; FOLLOWS HEATING;* *ALWAYS ON; ALWAYS OFF.*	*SUMMER* = period not included in heating season set in **24.19**	16.3
23.13	Remote Ext 21.0c for hours 3	Desired temperature during *REMOTE EXTENSION* period. Duration of *REMOTE EXTENSION* period	To activate *REMOTE EXTENSION* period close the switch C1 for at least 5 seconds (see wiring diagram) and then open it. To disactivate press ←and → at the same time from the first page of display.	17.5
23.14	Operation Boiler AUTOMATIC	Mode of operation of boiler(s): *ALWAYS ON; AUTOMATIC; or SET SEQUENCE* *1 - 2; SET SEQUENCE 2 - 1; AUTOMAT SEQUENCE*	*ALWAYS ON:* boilers are regulated by own thermostats. *AUTOMATIC:* boilers are regulated by controller.	13.2
23.15	Boiler with Heating Off:OFF	Operation of boiler with heating in Off mode: *OFF;* *ON.*	*OFF:* with heating in Off mode boilers switch off and switch on at request of DHW or external controllers. *ON:* with heating in Off mode boilers remain On.	13.7
23.16	Eco Off NO	Eco Off: *NO; ONLY PLANT;* *PLANT + BOILER*	In Normal or Setback modes with: • desired flow temp. - ambient temp. measured or calculated ≤ 2 °C = *Eco Off active*, valve closed, heating pump Off and if scheduled boiler Off. • Tfd – Ta meas. or calc. ≥ 4°C = *Eco Off not active*	14.8
23.17	OptimumStart :NO Optimum Stop :NO	Optimum Start and Optimum Stop functions: *NO;* *YES.*		15.3
23.18	Summer Plant Exercise: NO	Summer plant exercise functions : *NO; YES.*	To avoid lockouts, during summer period the controller periodically switches on valve and pumps.	17.8

24. EVENTS & PERIODS

Ref.	Display	Description	Notes	Sect.
24.1	How many 24hour Programmes ? 1	Choice of number of 24-hour programmes to be used (1…7).	Avoids scrolling unnecessary display pages.	17.1
24.2 ⇓ ⇓ 24.7	P1 Event 1 6.00 NORMAL 3 21.0c P1 Event 6 22.00 SETBACK 1 16.0c	Number of programme, number of event and time of start of period programmed. Choice type of mode to assign to period: *NORMAL 1…5;* *SETBACK 1- 2; FROSTPROT ; FLOW 1 - 2; OFF.* **Further groups of 6 pages according to choice in** **24.1**	Max. 6 periods. To eliminate an unused period press + and – together : there will appear – – – – The events must be in increasing order – – – – must not be left between programmed events. The modes set are the winter ones.	17.1

24. EVENTS & PERIODS

Ref.	Display	Description	Notes	Sect.
24.8	How many 7day Programmes ? 0	Choice of number of 7-day programmes to be used (1- 2).	Avoids scrolling unnecessary display pages.	17.2
24.9 ⇓ ⇓ 24.15	7day 1 MONDAY 24HOUR 1 — 7day 1 SUNDAY 24HOUR 1	Choice of programme for each day of week : 24HOUR 1…7 ; NORMAL 1...5; SETBACK 1 - 2; FROSTPROT ; FLOW 1 - 2; OFF. **Further pages according to choice in 24.8**	Appears only if in **24.8** number is superior to 0. Programmes set are the winter ones.	17.2
24.16	How many Holiday Periods ? 0	Choice of number of holiday periods to be used (0…25).	Avoids scrolling unnecessary display pages.	17.3
24.17	Holiday Program FROSTPROT 6.0c	Choice of programme for all the holiday periods: 7DAY 1 - 2; 24-HOUR 1…7 ; NORMAL 1...5; SETBACK 1 - 2; FROSTPROT ; FLOW 1 - 2; OFF.	Appears only if in **24.16** number is superior to 0. Programmes set are the winter ones.	17.3
24.18	Hol.01 Start NO Fr --.-- to --.--	NO = unused period; 00 = start at 00 hours; 12=start at 12 hours; Dates of start and end of holiday period. **Further pages according to choice in 24.16**	Appears only if in **24.16** number is superior to 0.	17.3
24.19	Heating Season Fr 15.10 to 15.04	Dates of start and end of heating season		17.6
24.20	Summer Time Fr 29.03 to 26.10	Dates of start and end of summer time period		17.7

25. MEAS & COUNT & CALC

Ref.	Display	Description	Notes	Sect.
25.1	Des Amb T :20.0c Act Amb T:20.5c	Ambient temperature desired by current mode. Temperature measure by ambient detector B3.		18.6
25.2	Des Flow T:80.0c Act Flow T:80.0c	Flow temperature desired by current mode. Temperature measured by flow detector B1.		18.6
25.3	Outside Temp Actual :−02.0c	*Actual* outside temperature measured by B2 or coming via C-Ring.	If outside detector B2 not connected and value comes via C-Ring, *Actual* is replaced by *C-Ring*.	18.6
25.4	Des DHW T :60.0c Act DHW T :58.0c	Desired DHW temperature Temperature measure by DHW detector B5.		18.6
25.5	DesBoilerT:60.0c ActBoilerT:58.0c	Desired boiler temperature Temperature measured by boiler detector B4		18.6
25.6	Flugas1Max: 185c B7 :00.0mA	Maximum temperature measured by B6 Value measured by active detector B7	If in **28.4** B6 is REMOTE CONTROL there will appear: B6 REMOTE. If in **28.5** B7 è FLUGAS+ALARMS there will appear: Flugas 2 Max : xxxc	18.6
25.7	Boiler1:xxxx hrs Boiler2:xxxx hrs	Operating hours boiler 1 or stage 1. Operating hours boiler 2 or stage 2.	Press + and – together to cancel the values Press + and – together to cancel the values	18.6
25.8	Degree-Days 20:xxxx Amb:xxxx	20: referred to fixed ambient temp. of 20 °C. Ambient: referred to actual or calculated ambient temp.		14.13

26. SETTING HEATING & DHW

Ref.	Display	Description	Notes	Sect.
26.1	Heat Emitters RADIATORS	Choice type of plant : *RADIATORS* ; *PANELS*; *FAN COILS*.		14.1
26.2	Design Outside Temp: − 5.0c	Design outside temperature for compensated control		14.2
23.3	Design Flow Temp: 70.0c	Design flow temperature for compensated control		14.2
26.4	CurveOrigin TO20 Flow T: 20.0c	Correction of heating curve origin		14.3
26.5	Flow T Limits Min: 1c Max:99c	Minimum & maximum limits flow temperature		14.5
26.6	Control: VALVE Time : 630sec	Actuator run time		14.6
26.7	AmbientAuthority on Flow : ----c	Ambient authority. Variation of ± °C of flow temp. with ± 1 °C ambient temp. difference.	Appears only if ambient detector B3 connected & configured	14.7
26.8	Start Inertia MANUAL 1.00h/c	Optimum start inertia.	*MANUAL* = correction of value manually *AUTOMATIC* = correction of value automatically	15.4
26.9	Opt Start Normal Max Durat: 2.00h	Maximum duration of optimum start period after a period of 24-hour or 7-day operation		15.5
26.10	OptStart Holiday Max Durat:10.00h	Maximum duration of optimum start period after a holiday period		15.5

26. SETTING HEATING & DHW

Ref.	Display	Description	Notes	Sect.
26.11	Optimum Start Boosting : 3.0c	Increase in degrees of desired ambient temperature during optimum start period		15.7
26.12	Cooling Time Constant: 48 hrs	Used when ambient detector B3 not installed to calculate decrease ambient temperature.		15.8
26.13	Optimum Stop DecreaseTA 0.5c	Value of reduction in desired ambient temperature during last event of end occupation		15.9
26.14	Optimum Stop MaxDurat: 1.00h	Maximum duration of optimum stop period.		15.10
26.15	Heatng Pump :AUT Delay Off: 30min	Control of plant pump: MAN; AUT. Delay in switching off pump.	MAN: always On; AUT: Follows programme in use.	14.12
26.16	DHW Pump Delay Off: NO	Delay in switching off pump.	NO: without delay; YES: 5 minutes delay.	16.5
26.17	DHW Differ: 3.0c Antibacteria:NO	Temp. difference for control DHW pump. Enabling of antibacterial function: NO; YES.	NO: antibacteria function excluded. YES: every Wednesday at 12 noon the DHW temperature is raised to 70 °C	16.2

27. SETTING BOILER

Ref.	Display	Description	Notes	Sect.
27.1	Type of Boiler 1BOILER 1STAGE	Choice of type of boiler(s) controlled: 1BOILER 1STAGE; 1BOILER 2 STAGES; 2 BOILERS IN SEQU		13.1
27.2	Control Boiler FIXED POINT	Choice of type of control of boiler(s). FIXED POINT; COMPENSATION.	COMPENSATION: The calculated temperature for the boilers follows the desired maximum for the heating zone, or of a circuit connected in C-Ring increased by Δt set in **27.3**. If DHW calls for heat (M2 = On) desired temp. moves to value set for 'FIXED POINT' **27.2**.	13.4
27.3	Desired Boiler Temp : 80.0c	Value of desired boiler temp.	Appears if in **27.2** FIXED POINT is set.	13.4
	Increase BoilerT on Htg : 5.0c	Value of desired increase in boiler temperature in respect maximum temp. requested by heating zones.	Appears if in **27.2** COMPENSATION is set.	13.5
27.4	Differential Boiler : 5.0c	Value of temperature differential for On-Off control of burner or stage.		13.3
27.5	Boiler T Limits Min: 1c Max:99c	Value of minimum and maximum temperature limits boiler flow.		13.6
27.6	DHW Priority & Anticondens :NO	Enabling DHW priority and anticondensing NO; YES.	NO : function excluded YES : If temperature boiler B4 ≤ 3 x Δt boiler (set in **27.4**) controller modulates closure of heating valve.	18.1
27.7	Off Stage 2: NO Outside T: 3.0c	Enabling function switching off 2nd boiler or 2nd stage at value of outside temperature set.	Appears if in **27.1** is set 1BOILER 2 STAGES or 2 BOILERS IN SEQU.	13.9

28. CONFIGURATION CONTROLLER

Ref.	Display	Description	Notes	Sect.
28.1	Send Alarms :NO PassWTeleman :NO	Enabling alarms to send to telemanagement PC Enabling telemanagement keynumber	Only if connected in C-Bus.	11.5
28.2	Address : ——— Group : —	Telematic address of controller Group to which controller belongs	Only if connected in C-Bus	11.4
28.3	CRing Connection NO	NO : Not connected in C-Ring YES : Connected as Primary		11.1
28.4	Input B6 FLUGAS + ALARM	Configuration of input detector B6 : FLUGAS+ALARM; REMOTE CONTROL.	FLUGAS+ALARM: flugas detector + input alarm REMOTE CONTROL: remote control R	18.2 14.11
28.5	Input B7 FLUGAS + ALARM	Configuration of input detector B7: FLUGAS+ALARM; 4 ... 20 mA.	FLUGAS+ALARM: flue gas detector + input alarm 4 ... 20 mA: actve detector B8	18.3
28.6	FunctionalAlarms 1 2 3 4 5 6 7 8	Disabling functional alarms Factory setting : enabled only 8 (cannot be disabled)	1 : Flow temperature alarm **B1**. 2 : Boiler temperature alarm **B4**. 3 : Ambient temperature alarm **B3**. 4 : Overtemperature boiler **B4**. 5 : DHW temperature alarm **B5**. 6 : Temperature flue gases 1 alarm **B6**. 7 : Temperature flue gases 2 alarm **B7**. 8 : Internal real time clock alarm.	19.1

28. CONFIGURATION CONTROLLER

Ref.	Display	Description	Notes	Sect.
28.7	Detector Alarms 1 2 3 4 5 6 7 8	Enabling alarms for short or open circuit detectors Factory setting : all enabled.	1 : Flow detector **B1**. 2 : Outside detector **B2**. 3 : Ambient detector **B3**. 4 : Boiler detector **B4**. 5 : DHW detector **B5**. 6 : Temperature flue gases 1 **B6**. 7 : Temperature flue gases 2 **B7**. 8 : C-Ring alarm.	19.2
28.8	K Alarms − − − − −	Enabling On-Off alarms. Factory setting : all disabled		19.3
28.9	Choice Keynumber - - - -	Choice keynumber for preventing use + and – keys. – 1901 … 1999	To eliminate keynumber press + and – together.	18.4
28.10	NameHeatingPlant - - - - - - - - - -	Entering name of site (plant).	Use + and – to enter letters or digits. Use ← and → to position cursor.	18.5

29. TESTING

Ref.	Display	Description	Notes	Sect.
29.1	CRing:??	Page of testing C-Ring connections. *??* = test in progress or test negative *YES* = test positive	Appears only if in **28.3** is *YES*.	20.1
29.2	Output:VALVE Status:IDLE	Choice outputs to test Choice output status	Choice output : *VALVE* ; *PUMP* ; *DHW*; *BOILER 1; BOILER 2* Choice status: With VALVE : *IDLE* ; *CLOSES* ; *OPENS*. With PUMP, DHW; BOILER 1; BOILER 2: *ON* ; *OFF*.	20.2

We reserve the right to make changes witout notice